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EXAMINER	
ANDREWS, LEON T	
ART UNIT	**PAPER NUMBER**
2616	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/809,591	BANERJEE ET AL.	
	Examiner	Art Unit	
	Leon Andrews	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

- Applicant's Amendment filed October 24, 2007 is acknowledged.
- **Claims 1, 8 and 15** were amended.
- Examiner's Rejection to **Claims 1-21** is not withdrawn.

1. **Claims 1, 3-8, 10-15 and 17-21** are rejected under 35 U.S.C. 102 (e) as being anticipated by Firoiu et al. (Patent No.: US 7,149,664).

Regarding Claims 1, 8 and 15, Firoiu et al. discloses a method, apparatus and computer program product for dynamically provisioning computer system resources (method, apparatus and computer program product for modeling dynamics of a queue, column 2, lines 9-11), the method comprising:

monitoring a connection performance parameter of a data communications port (each node (connection), having at least one ingress and one egress port is regulated (monitored) by a node congestion control module which also regulates the average queue size, column 3, lines 37-48) operating in a data communications protocol (TCP as the transport layer protocol, column 3, lines 53-54) having a connection backlog queue (Fig. 13, Queue) having a connection backlog queue size (Fig. 13, Queue Size), the connection backlog queue comprising one or more connection requests (end-system congestion control module responds to the node congestion control module's acknowledgement (requests) packets indicating congestion, by decreasing the sending rate, column 3, lines 37-60); and

changing the connection backlog queue size in dependence upon the monitored connection performance parameter without interrupting the operation of the data communications port and without user intervention (Fig. 2, 210, 220 and 230, evaluate the Queue and control functions and make a determination based on traffic conditions).

Regarding Claims 3, 10 and 17, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (management of a queue at a node in the network, column 1, lines 14-15) further comprises monitoring a connection backlog queue load (Fig. 10, 1020; a maximum value at Qmax; node receive packets which are stored and queued in a buffer, column 3, lines 38-41); and

changing the connection backlog queue size further comprises changing the backlog queue size in dependence upon the connection backlog queue load (Figs. 10. 1000, 1010, calculate the maximum queue and designate the Qmax to a point above the maximum queue).

Regarding Claims 4, 11 and 18, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (management of a queue at a node in the network, column 1, lines 14-15) further comprises calculating an average round trip time (calculation of the average round trip time for data to be sent from the first node to the second node and acknowledgement to be received by the first node, column 2, lines 18-21) for a portion of a connection handshake (Fig. 1, link utilization between the first and second nodes, column 2,

lines 16-17) and calculating an average arrival interval (Fig. 15, P,I) between connection requests; and

changing the connection backlog queue size further comprises increasing the connection backlog queue size (the queue size is increased when the buffer size is increased, column 1, lines 35-36) if the average arrival interval is less than the average round trip time ((Fig. 15, P, I) < (calculation of the average round trip time for data to be sent from the first node to the second node and acknowledgement to be received by the first node, column 2, lines 18-21)) and decreasing the connection backlog queue size (Fig. 6, Qmin; decreasing the size of the average queue in the buffer, column 4, line 9-10) if the average arrival interval is greater than the average round trip time ((Fig. 15, P,I) > (calculation of the average round trip time for data to be sent from the first node to the second node and acknowledgement to be received by the first node, column 2, lines 18-21)).

Regarding Claims 5, 12 and 19, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (management of a queue at a node in the network, column 1, lines 14-15) further comprises calculating a bandwidth delay product (resource demand exceeds capacity when data is not sent as quickly as it is received, column 1, lines 20-23) for a connection backlog queue (Fig. 13, Queue and Queue size) and comparing the bandwidth delay product with the queue size (operation point can be compared to the queue size, column 12, lines 31-32); and

changing the connection backlog queue size (Fig. 13; traffic conditions change causing the node to operate in overload outside the normal operating conditions, column 8, lines 1-3) further comprises changing the backlog queue size to at least the bandwidth delay product if the connection backlog queue size is less than the bandwidth delay product ((Fig. 13, Queue and Queue size) < (resource demand exceeds capacity when data is not sent as quickly as it is received, column 1, lines 20-23)).

Regarding Claims 6, 13 and 20, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (management of a queue at a node in the network, column 1, lines 14-15) further comprises measuring accept processing time (Fig. 15, P, I); and

changing the connection backlog queue size further comprises changing the backlog queue size in dependence upon accept processing time (Fig. 15, variation in the sending rate is reflected in a variation in the queue size, column 11, lines 41-42).

Regarding Claims 7, 14 and 21, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (management of a queue at a node in the network, column 1, lines 14-15) further comprises calculating an average accept processing time (Fig. 13, amount of data that a link can process in a given time, column 3, lines 34-35) and calculating an average connection request arrival interval (Fig. 15, P, I) for a connection backlog queue (Fig. 13, Queue and Queue size); and

changing the connection backlog queue size further comprises increasing the connection backlog queue size if the accept processing time is greater than the connection request arrival interval ((Fig. 13, amount of data that a link can process in a given time, column 3, lines 34-35) > (Fig. 15, P, I)).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2, 9 and 16 are being rejected under 35 U.S.C. 103(a) as being unpatentable in view of Firoiu et al. being an obvious variation. (It is obvious to have "a connection request" interpreted as "a network operation").

Claims 2, 9 and 16, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (each node (connection), having at least one ingress and one egress port is regulated (monitored) by a node congestion control module which also regulates the average queue size, column 3, lines 37-48) further comprises receiving a connection request (network operation environment, column 9, lines 59-60) and determining that the connection backlog queue is full (Fig. 2, 230, determine the rate based upon the Queue and the control function; when the queue size exceeds the preset threshold, column 1, lines 50-51); and

changing the connection backlog queue size in dependence upon the monitored connection performance parameter further comprises increasing the connection backlog queue size (Figs. 10. 1000, 1010, calculate the maximum queue and designate the Qmax to a point above the maximum queue).

Regarding Claims 2, 9 and 16, Firoiu et al. teaches all the claims limitations, but does not explicitly discloses "a connection request".

However, Firoiu et al. does disclose a network operation environment having a defined set of maximum traffic conditions (column 9, lines 59-61).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use "a network operation" as "a connection request" since this would have allowed the queue law function to determine the needed buffer size (column 9, lines 58-59).

Citation of Pertinent Prior Art

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Creemer (Patent Number: 5,951,644) discloses system for predicting and managing network performance by managing and monitoring resource utilization and connection of network.

Skirmont (Patent Number: US 6,252,848 B1) discloses system performance in a data network through queue management based on ingress rate monitoring.

Walrand et al. (Patent No.: US 6,647,413 B1) discloses method and apparatus for measuring performance in packet switched networks.

Aweya et al. (Patent No.: US 6,901,593 B2) discloses active queue management with flow proportional buffering.

Alam et al. (Patent No.: US 7,069,313 B2) discloses methods and systems for preventing socket flooding during denial of service attacks.

Response to Arguments

4. Applicant's arguments filed October 24, 2007 have been fully considered, but they are not persuasive.

- In the remarks on pages 11 and 12 of the amendment, applicant contends that for claim 1, Firoiu et al. does not disclose monitoring a connection performance parameter of a data communications port operating in a data communication protocol having a connection backlog queue which has a

backlog queue size and the connection backlog queue comprises one or more connection requests. Further, Firoiu et al. did not anticipate claim 1 since every element and limitation of the applicant's claims were not disclosed and the rejection should be withdrawn.

The examiner respectfully disagrees and contends that Firoiu et al. discloses that each node (connection), having at least one ingress and one egress port is regulated (monitored) by a node congestion control module which also regulates the average queue size, column 3, lines 37-48, whereby the nodes receive multiple flows of data within the network that employs TCP as the transport layer protocol and receiving multiple flows of data with each flow being stored and queued (backlog queue, Fig. 13) in a buffer. Further, the end-system congestion control module responds to the node congestion control module's acknowledgement (requests) packets indicating congestion, by decreasing the sending rate, column 3, lines 37-60. Thus, Firoiu et al. anticipated claim 1 by disclosing that monitoring a connection performance parameter of a data communications port (each node (connection), having at least one ingress and one egress port is regulated (monitored) by a node congestion control module which also regulates the average queue size, column 3, lines 37-48) operating in a data communications protocol (TCP as the transport layer protocol, column 3, lines 53-54) having a connection backlog queue (Fig. 13, Queue) having a connection backlog queue size (Fig. 13, Queue Size), the connection backlog queue comprising one or more

connection requests (end-system congestion control module responds to the node congestion control module's acknowledgement (requests) packets indicating congestion, by decreasing the sending rate, column 3, lines 37-60); and changing the connection backlog queue size in dependence upon the monitored connection performance parameter without interrupting the operation of the data communications port and without user intervention (Fig. 2, 210, 220 and 230, evaluate the Queue and control functions and make a determination based on traffic conditions). Therefore, claim 1 rejection will not be withdrawn.

- In remarks on pages 13 and 14 of the amendment, applicant contends Firoiu et al. does not disclose changing the connection backlog queue size in dependence upon the monitored connection performance parameter without interrupting the operation of the data communications port and without user intervention. Further, Firoiu et al. did not anticipate applicant's claims since every element of the claims and limitation were not disclosed and the rejections should be withdrawn.
- The examiner respectfully disagrees and contends that Firoiu et al. discloses that each node (connection), having at least one ingress and one egress port is regulated (monitored) by a node congestion control module which also regulates the average queue size, column 3, lines 37-48. Further, Firoiu et al. discloses evaluating the queue and control function and a determination is

made based upon traffic conditions and drop rate, Fig. 2, 210, 220 and 230. Thus Firoiu et al. did anticipate applicant's claim and the rejection would not be withdrawn.

- In the remarks on pages 14 and 15 of the amendment, applicant contends that Firoiu et al. does not disclose a system and computer program corresponding to independent claims 8 and 15. Thus, claims 8 and 15 were patentable and should be allowed. Further, Firoiu et al. does not disclose every element of independent claims 1, 8 and 15 or their dependent claims 2-7, 9-14 and 16-21 respectively and did not anticipate claims 1-21. As such, claims 1-21 are patentable and should be allowed.
- The examiner respectfully disagrees and contends that Firoiu et al. discloses a computer program product for use with a computer system may be implemented as method and apparatus in queue management, column 13, lines 16-18. Further, Firoiu et al. contends that **Regarding Claims 1, 8 and 15,** Firoiu et al. discloses a method, apparatus and computer program product for dynamically provisioning computer system resources (method, apparatus and computer program product for modeling dynamics of a queue, column 2, lines 9-11), the method comprising:

  monitoring a connection performance parameter of a data communications port (each node (connection), having at least one ingress and one egress port is regulated (monitored) by a node congestion control module which also regulates the average queue size, column 3, lines 37-48) operating in a data

communications protocol (TCP as the transport layer protocol, column 3, lines 53-54) having a connection backlog queue (Fig. 13, Queue) having a connection backlog queue size (Fig. 13, Queue Size), the connection backlog queue comprising one or more connection requests (end-system congestion control module responds to the node congestion control module's acknowledgement (requests) packets indicating congestion, by decreasing the sending rate, column 3, lines 37-60); and

changing the connection backlog queue size in dependence upon the monitored connection performance parameter without interrupting the operation of the data communications port and without user intervention (Fig. 2, 210, 220 and 230, evaluate the Queue and control functions and make a determination based on traffic conditions).

Claims 2, 9 and 16, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (each node (connection), having at least one ingress and one egress port is regulated (monitored) by a node congestion control module which also regulates the average queue size, column 3, lines 37-48) further comprises receiving a connection request (network operation environment, column 9, lines 59-60) and determining that the connection backlog queue is full (Fig. 2, 230, determine the rate based

upon the Queue and the control function; when the queue size exceeds the preset threshold, column 1, lines 50-51); and

changing the connection backlog queue size in dependence upon the monitored connection performance parameter further comprises increasing the connection backlog queue size (Figs. 10. 1000, 1010, calculate the maximum queue and designate the Qmax to a point above the maximum queue).

Regarding Claims 2, 9 and 16, Firoiu et al. teaches all the claims limitations, but does not explicitly discloses "a connection request".

However, Firoiu et al. does disclose a network operation environment having a defined set of maximum traffic conditions (column 9, lines 59-61).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use "a network operation" as "a connection request" since this would have allowed the queue law function to determine the needed buffer size (column 9, lines 58-59).

Regarding Claims 3, 10 and 17, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (management of a queue at a node in the network, column 1, lines 14-15) further comprises monitoring a connection backlog queue load (Fig. 10, 1020, a maximum value at Qmax; node receive packets which are stored and queued in a buffer, column 3, lines 38-41); and

changing the connection backlog queue size further comprises changing the backlog queue size in dependence upon the connection backlog queue load (Figs. 10. 1000, 1010, calculate the maximum queue and designate the Qmax to a point above the maximum queue).

Regarding Claims 4, 11 and 18, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (management of a queue at a node in the network, column 1, lines 14-15) further comprises calculating an average round trip time (calculation of the average round trip time for data to be sent from the first node to the second node and acknowledgement to be received by the first node, column 2, lines 18-21) for a portion of a connection handshake (Fig. 1, link utilization between the first and second nodes, column 2, lines 16-17) and calculating an average arrival interval (Fig. 15, P,I) between connection requests; and

changing the connection backlog queue size further comprises increasing the connection backlog queue size (the queue size is increased when the buffer size is increased, column 1, lines 35-36) if the average arrival interval is less than the average round trip time ((Fig. 15, P, I) < (calculation of the average round trip time for data to be sent from the first node to the second node and acknowledgement to be received by the first node, column 2, lines 18-21)) and decreasing the connection backlog queue size (Fig. 6, Qmin; decreasing the

size of the average queue in the buffer, column 4, line 9-10) if the average arrival interval is greater than the average round trip time ((Fig. 15, P,I) > (calculation of the average round trip time for data to be sent from the first node to the second node and acknowledgement to be received by the first node, column 2, lines 18-21)).

Regarding Claims 5, 12 and 19, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (management of a queue at a node in the network, column 1, lines 14-15) further comprises calculating a bandwidth delay product (resource demand exceeds capacity when data is not sent as quickly as it is received, column 1, lines 20-23) for a connection backlog queue (Fig. 13, Queue and Queue size) and comparing the bandwidth delay product with the queue size (operation point can be compared to the queue size, column 12, lines 31-32); and

changing the connection backlog queue size (Fig. 13; traffic conditions change causing the node to operate in overload outside the normal operating conditions, column 8, lines 1-3) further comprises changing the backlog queue size to at least the bandwidth delay product if the connection backlog queue size is less than the bandwidth delay product ((Fig. 13, Queue and Queue size) < (resource demand exceeds capacity when data is not sent as quickly as it is received, column 1, lines 20-23)).

Regarding Claims 6, 13 and 20, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (management of a queue at a node in the network, column 1, lines 14-15) further comprises measuring accept processing time (Fig. 15, P, I); and

changing the connection backlog queue size further comprises changing the backlog queue size in dependence upon accept processing time (Fig. 15, variation in the sending rate is reflected in a variation in the queue size, column 11, lines 41-42).

Regarding Claims 7, 14 and 21, Firoiu et al. discloses a method, apparatus and computer program product of claim 1 wherein:

monitoring a connection performance parameter (management of a queue at a node in the network, column 1, lines 14-15) further comprises calculating an average accept processing time (Fig. 13, amount of data that a link can process in a given time, column 3, lines 34-35) and calculating an average connection request arrival interval (Fig. 15, P, I) for a connection backlog queue (Fig. 13, Queue and Queue size); and

changing the connection backlog queue size further comprises increasing the connection backlog queue size if the accept processing time is greater than the connection request arrival interval ((Fig. 13, amount of data that a link can process in a given time, column 3, lines 34-35) > (Fig. 15, P, I)). Thus, Firoiu et al. disclosed every element of the independent claims 1, 8 and 15 and their

dependent claims 2-7, 9-14 and 16-21 and did anticipate claims 1-21 as such, dependent claims 1-21 were not patentable and would not be allowed.

- In remarks on pages 14 and 15 of the amendment, applicant contended that Firoiu et al. did not establish a prima facie case for dependent claims 2, 9 and 16 since every element of independent claims 1, 8 and 15 were not disclosed and rejection under 35 USC 103 (a) should be withdrawn.
- The examiner respectfully disagrees and contends that regarding claims 2, 9 and 16, Firoiu et al. teaches all the claims limitations, but does not explicitly discloses "a connection request".

However, Firoiu et al. does disclose a network operation environment having a defined set of maximum traffic conditions (column 9, lines 59-61).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use "a network operation" as "a connection request" since this would have allowed the queue law function to determine the needed buffer size (column 9, lines 58-59). Thus, rejection under 35 USC 103 (a) will not be withdrawn.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Andrews whose telephone number is (571) 270-1801. The examiner can normally be reached on Monday through Friday 7:30 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rao S. Seema can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LA/la LA
July 10, 2007

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